SANYO

All fasteners subject to metric dimension of International Organization for Standadization.

Solid State, FM/AM 3-band Portable Radio

MODEL 10GA-895Z

SERVICE MANUAL

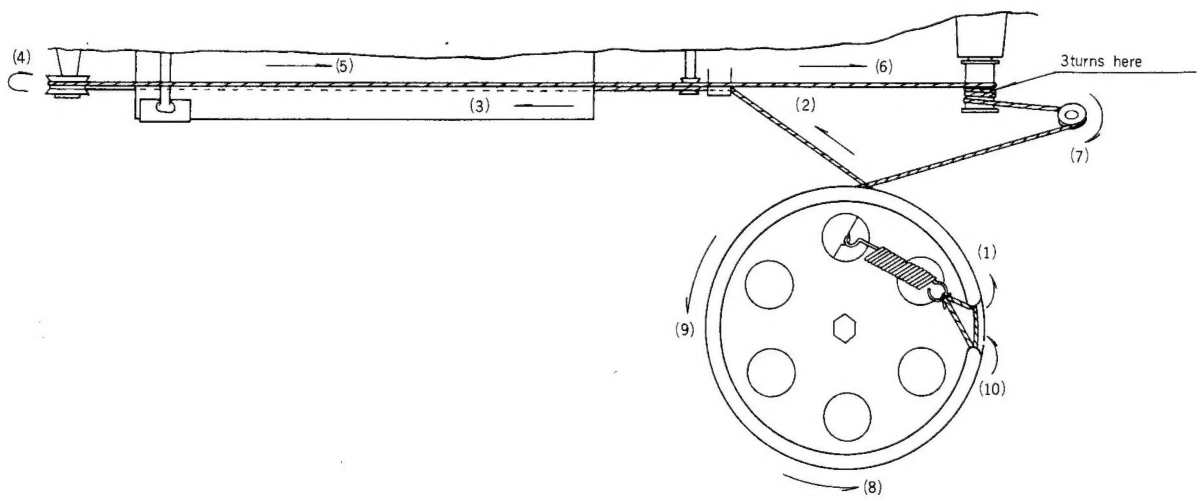
SANYO ELECTRIC CO., LTD.

INTERNATIONAL DIVISION: SANYO ELECTRIC TRADING CO., LTD.
OSAKA JAPAN

SPECIFICATIONS

FREQUENCY RANGES:	FM 87.5 - 104 MHz SW 5.95 - 15.5 MHz MW 510 - 1605 KHz	INTEGRATED CIRCUIT:	LA-1200 or LA-1201, IF Stage
INTERMEDIATE FREQUENCY:	FM 10.7 MHz AM 455 KHz	TRANSISTORS:	Tr1 2SC668, FM RF Amplifier Tr2 2SC772, FM Converter Tr3 2SC829, AM Converter Tr4 2SB185, Audio Amplifier Tr5 2SB186, Driver Tr6, 7 2SB22, Power Output
SENSITIVITY: (for 50mW output)	FM 3μV SW 80μV/m MW 80μV/m	DIODES:	D1, 2 MA-26, AM Stabilizer D3 1S188, AM Oscillator Limiter D401 1S188, FM AGC D402 D403 1S188, FM Discriminator
POWER OUTPUT:	Maximum 800 mW Undistorted 550 mW	SPEAKER:	4" Permanent Dynamic Type 4 ohm voice coil impedance
POWER SUPPLY:	Four 1½-volt "size D" standard batteries AC 220-volt household current	DIMENSIONS:	9½" wide x 5-5/8" high x 2¼" deep
CURRENT DRAIN:	No signal 20 mA Maximum 230 mA	WEIGHT:	2.4 lbs.

DIAL CORD STRINGING



HOW TO TAKE OUT CHASSIS

1. Loosen three oval counter-sunk head screws on the bottom of radio housing.
2. Lift and open the back of housing.
3. Remove three screws (red colored on their heads) which fasten the chassis to the front housing.
4. Take out the chassis from it carefully.

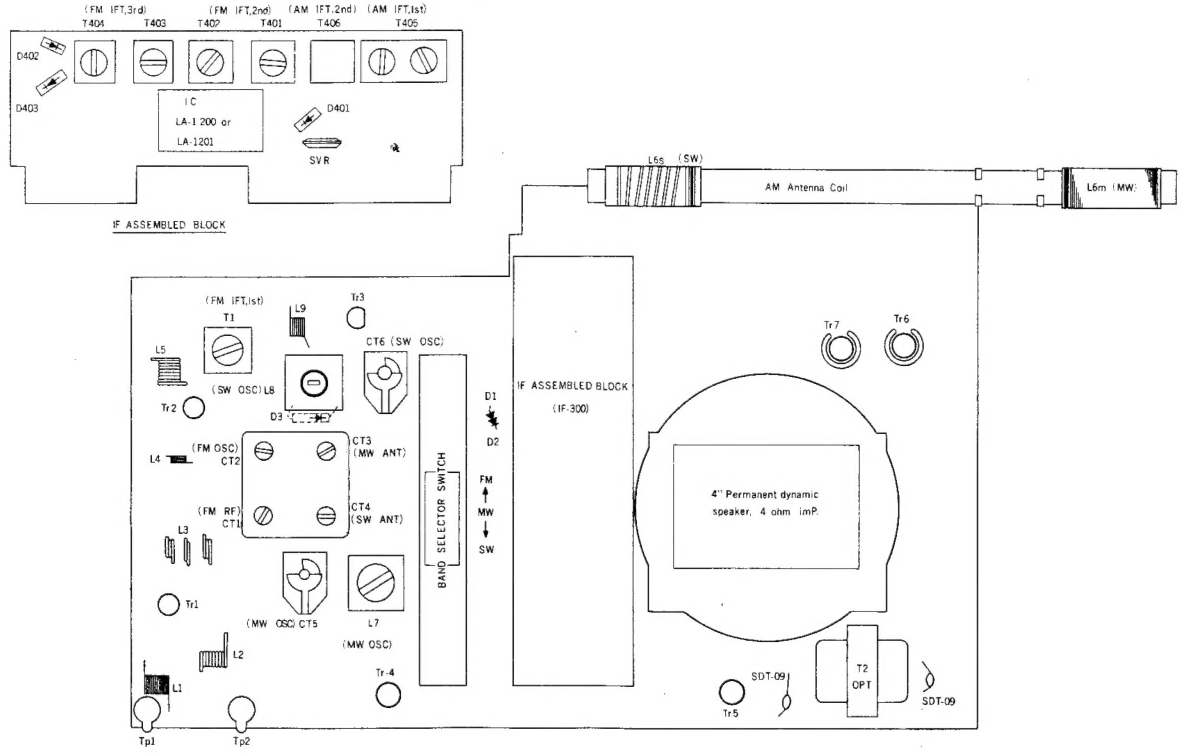
ALIGNMENT OF IF STAGE

PROCEDURES	SETTING OF CONTROL KNOBS ON RADIOS	ALIGNMENT FREQUENCY	TEST EQUIPMENT CONNECTION	ADJUSTMENT
FM IF STAGE	Volume control at minimum. Band switch at FM.	10.7 MHz	Connect output cable of FM sweep marker generator to Tp-1 and Tp-2, input cable thru network to Tp-3 and Tp-4.	Tune T403, T402 & T401 for maximum gain and symmetry of response curve.
FM IF STAGE	The same as above.	10.7 MHz	Connect output cable of FM sweep marker generator to Tp-1 and Tp-2, input cable thru network to Tp-5 and Tp-4.	Tune T404 for perfect symmetry and linearity of S-shape curve.
AM IF STAGE	Volume control at maximum. Band switch at MW. Dial pointer at 510 KHz.	455 KHz	Connect output cable of AM signal Generator to IRE loop.	Tune T405 for maximum audio output.

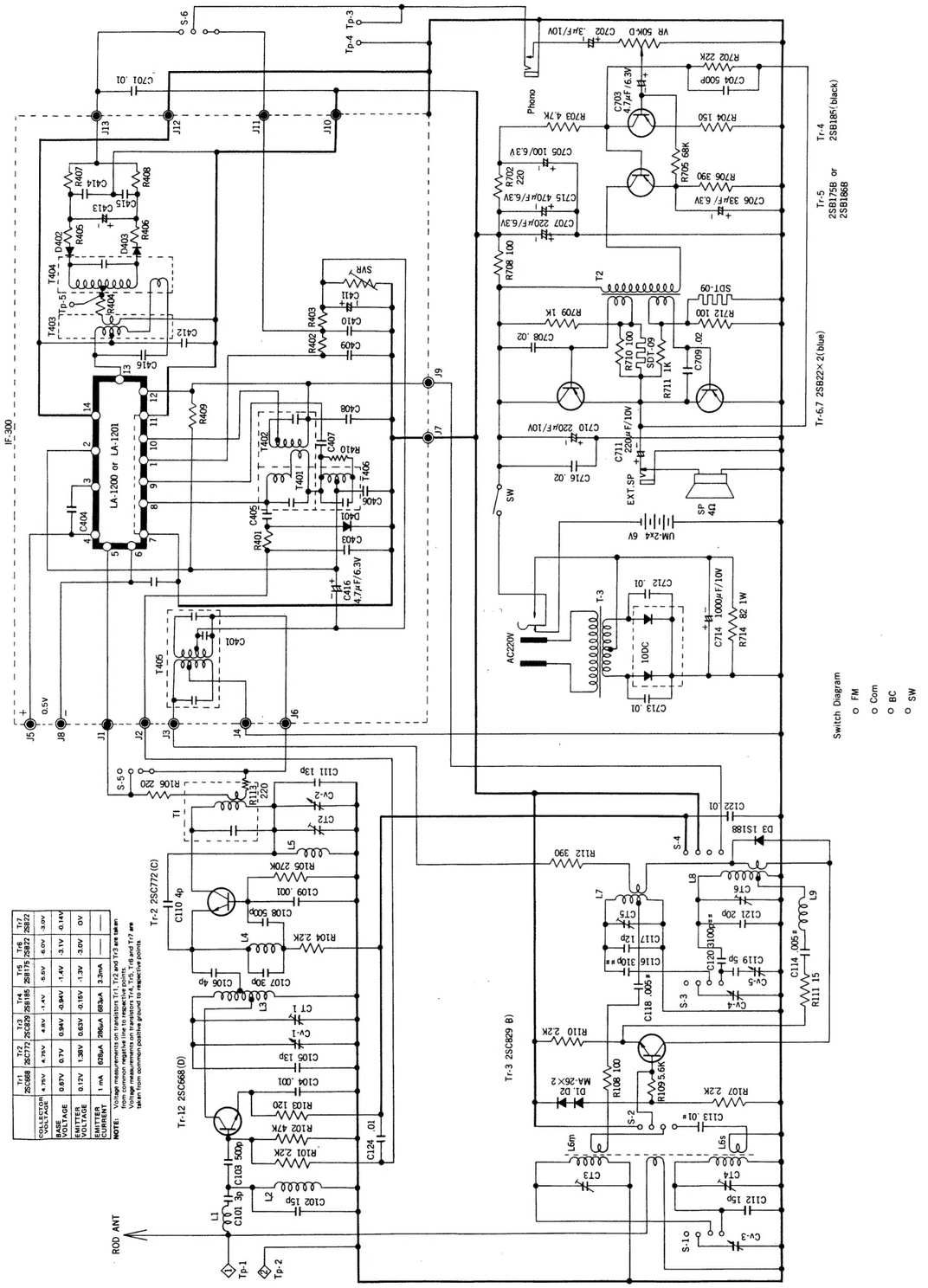
BAND COVERAGE & TRACKING ALIGNMENT

PROCEDURES	POSITION OF BAND SWITCH	SIGNAL INPUT	FREQUENCY OF SIGNAL GEN.	DIAL SETTING OF RADIO	COMPONENTS TO BE ADJUSTED	
MW BAND COVERAGE	MW	IRE LOOP	505 KHz	Lowest End	MW Oscillator Coil	L7
	"	"	1650 KHz	Highest End	MW Oscillator Trimmer	CT5
MW BAND TRACKING	MW	IRE LOOP	570 KHz	570 KHz	MW Antenna Coil	L6m
	"	"	1400 KHz	1400 KHz	MW Antenna Trimmer	CT3
SW BAND COVERAGE	SW	IRE LOOP	5.8 MHz	Lowest End	SW Oscillator Coil	L8
	"	"	16.0 MHz	Highest End	SW Oscillator Trimmer	CT6
SW BAND TRACKING	SW	IRE LOOP	6.5 MHz	6.5 MHz	SW Antenna Coil	L6s
	"	"	15.0 MHz	15.0 MHz	SW Antenna Trimmer	CT4
FM BAND COVERAGE	FM	DUMMY ANT.	87 MHz	88 MHz	FM Oscillator Coil	L5
	"	"	104.5 MHz	104 MHz	FM Oscillator Trimmer	CT2
FM IF STAGE	FM	DUMMY ANT.	90 MHz	90 MHz	FM IF Transf.	T1 & T404
FM BAND TRACKING	FM	DUMMY ANT.	90 MHz	90 MHz	FM RF Coil	L3
	"	"	103 MHz	103 MHz	FM RF Trimmer	CT1

MAIN PARTS IDENTIFICATION



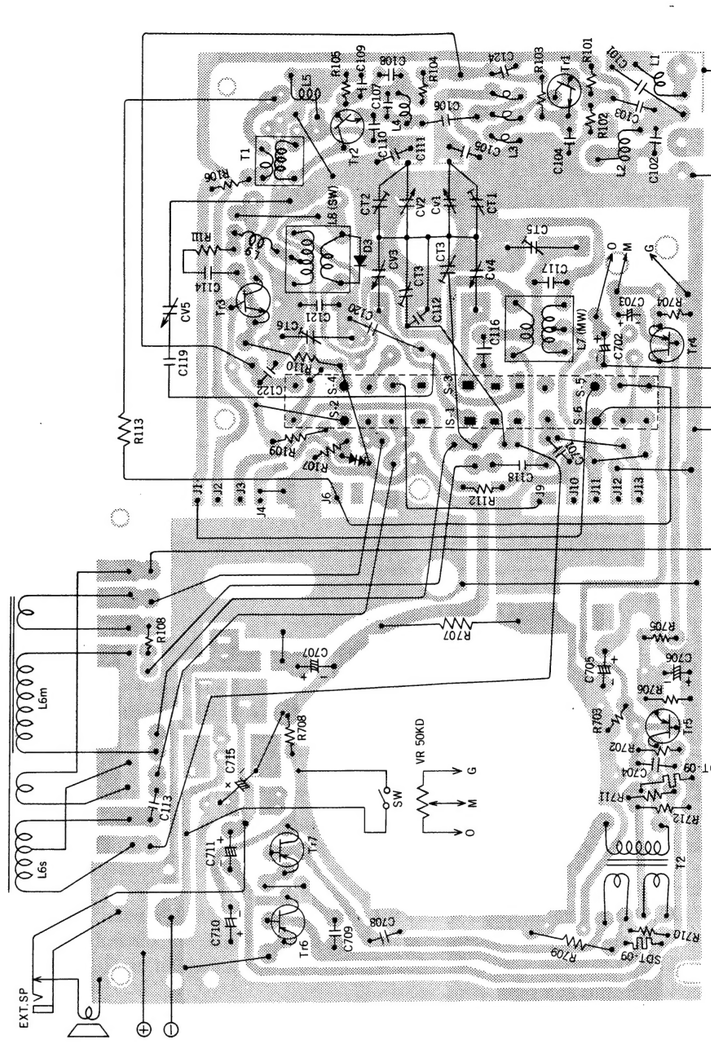
SCHEMATIC DIAGRAM

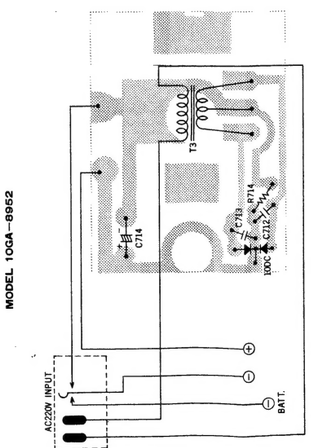


	Tr1 2SC668	Tr2 2SC772	Tr3 2SC829	Tr4 2SB185	Tr5 2SB175	Tr6 2SB22	Tr7 2SB22
COLLECTOR VOLTAGE	4.78V	4.78V	4.8V	-1.4V	-5.8V	-6.0V	-3.0V
BASE VOLTAGE	0.67V	0.7V	0.64V	-0.94V	-1.4V	-3.1V	-0.14V
EMITTER VOLTAGE	0.12V	1.38V	0.63V	-0.15V	-1.3V	-3.0V	0V
EMITTER CURRENT	1 mA	628uA	286uA	683uA	3.3mA	—	—

NOTE: Voltage measurements on transistors Tr1, Tr2 and Tr3 are taken from common negative line to respective points. Voltage measurements on transistors Tr4, Tr5, Tr6 and Tr7 are taken from common positive ground to respective points.

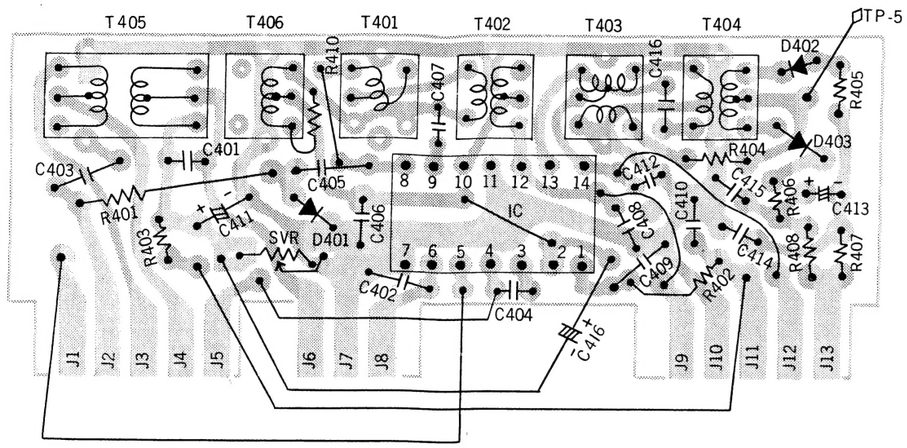
INTER PARTS WIRING ILLUSTRATION





IF ASSEMBLED BLOCK (IF-300)

INTER PARTS WIRING ILLUSTRATION



VOLTAGE CHART OF IC's TERMINALS

The number of connector leads	1	2	3	4	5	6	7
Voltage	2.55V	2.98V	0.67V	1.3V	1.38V	0.72V	0V
The number of connector leads	14	13	12	11	10	9	8
Voltage	5V (4.7V)	5V (4.7V)	0.05V (2.02V)	0V	0.03V (2.02V)	0.65V	2.9V

NOTE:

Measurements are taken from common negative line to respective terminals.
Values in parentheses shows FM operation.
It is right to judge that IC works satisfactorily when a measured voltage of terminal "2" is in a range of 3 ± 0.2 volts.

ALIGNMENT PROCEDURES

IF Assembled Block (IF-300) shall not require any arrangement in ordinary servicing, as it has been factory-adjusted completely. When there is some faulty found in it, it may be replaced easily by new one.

How to set Semi-fixed Resistor (SVR)
A semi-fixed resistor (SVR 50K) is adjusted and set in such a way as to develop 0.5 volt between the terminal J5 and J8. In order to check this value, use a 0.1 miliampere range of circuit tester and connect a 50K ohm resistor with one of its terminals in series. A reading of 10 micro-amperes on the meter is correct, when applied and measured across two terminals. The adjustable resistor, however, is inaccessible in a condition that it is built into a radio unit.

PARTS LIST (IF-300)

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
T401	R-W5T361-3	IF Transformer – FM
T402	R-W5T364-3	IF Transformer – FM
T403	R-W5T309-3	IF Transformer – FM
T404	R-W5T310-3	IF Transformer – FM
T405	R-W5T589-3	IF Transformer – AM
T406	R-W5T602-3	IF Transformer – AM
	LA-1200 or LA-1201	Integrated Circuit
D401	1S188 AM	Diode
D402 D403	1S188 FM	Diode – discriminator
SVR	R-11010	Semi-fixed Resistor 50K
C411	R-C9205	Electrolytic Capacitor 10μF 6.3V
C413 C416	R-C9882	Electrolytic Capacitor 4.7μF 6.3V

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
(FIXED VALUE RESISTORS)		
R401	R-R682K	6.8K ohms ±10% ¼W
R402 R405 R406	R-R102K	1K ohms ±10% ¼W
R403	R-R153K	15K ohms ±10% ¼W
R404	R-R271K	270 ohms ±10% ¼W
R407 R408	R-R562K	5.6K ohms ±10% ¼W
R409	R-R152K	1.5K ohms ±10% ¼W
R410	R-R473K	47K ohms ±10% ¼W
(FIXED VALUE CAPACITORS)		
C401	R-CQS502M	Mylar 0.005μF ±20%
C402 C403 C406 C412	R-CKD203Z	Ceramic 0.02μF +80%
C404 C408 C409 C410	R-CKS103Z	Ceramic 0.01μF +80%
C405	R-CKD100K	Ceramic 10pF ±10% mini
C407	R-CKD201M	Ceramic 200pF ± 20% mini
C414 C415	R-CKD102Z	Ceramic 0.001μF +80% mini
C416	R-CKD350K	Ceramic 35pF ±10% mini

PARTS LIST (10GA-895Z)

PART NO.	DESCRIPTION	Q'TY
(HOUSING)		
R-AR	Housing Assembly – front & back complete	1
R-S81833	Front Housing Frame	1
R-311157	Side Plastic	1
R-311158	Side Plastic w/ jack opening	1
R-262198	Badge SANYO	1
R-38216	Dial Scale	1
R-262203	Metal Strip AC/Battery	1
R-471961	Battery Instruction	1
R-	Open-pore Foam Cushion 25x15x8t	1
R-36297	Ribbon - battery-take-out	1
R-311156	Compartment Lid - battery	1
R-471937	IC Label	1
R-S81834	Back Housing Assembly	1
R-262197	Metal Strip	1
R-471937	Specification Sheet	1
R-262201	Marking Metal - FM MW SW	1
R-S81772	Knob - tuning control	1
R-S81773	Knob - volume & fine tuning	2
R-36137	Switch Cover - band switch	1
R-S81771	Pointor	1
R-S81770	Handle	1
R-241556	Stud Screw - handle mtg ISO	2
R-113465	Stopper - handle mtg	2
R-	Ethylene Washer 9.3φx5.3φx0.3t handle mtg	4
R-113377	Metal Mount - speaker mtg	1
R-262304	Metal Disc - telescopic antenna	1
R-311282	Plastic Cover - on back housing	1
R-36292	Vinyl Sheet - speaker's yoke	1
(CHASSIS)		
R-39498	Plastic Chassis	1
R-	Paper Sheet 38.5x124.5 on plastic chassis	1
R-424485	Paper Sheet on plastic chassis	1
R-241571	Tuning Shaft	1
R-39447	Drum	1
R-S7083	Special Screw - drum mtg	1
R-275021	Pulley	1
R-27064	Pulley	1
R-113552	Metal Mount - pulley mtg	1
R-24344	Pulley Shaft	1
R-27077	Pulley	1
R-	Dial Cord 0.3φ tetron 850mm	1
R-128231	Tension Spring - dial cord stringing	1
R-44065	Cushion - tuning capacitor mtg	1
R-261416	Holder - antenna coil mtg	1
R-	Rubber Cushion 32x10x1t - antenna coil mtg	2

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
(SEMICONDUCTORS)		
Tr1	2SC668D	Transistor (for RF stage)
Tr2	2SC772C	Transistor (for oscillator stage)
Tr3	2SA222	Transistor (green color)
Tr4	2SB185	Transistor (black color)
Tr5	2SB186B 2SB175B	Transistor (hfe 95~210)
Tr6 Tr7	2SB22	Transistor (blue color)
	SDT-09	Thermistor
D1 D2	MA-26	Diode
D3	1S188AM	Diode
	R-S1347	Rectifier 1S185D or 10DC
(CONTROLS)		
	R-C1126	Variable Capacitor - main tuning
Cv5	R-C1132	Variable Capacitor - fine tuning
VR	R-R11673	Variable Resistor - volume control, 50K D
	R-S4412	Slide Switch - band selector
CT5 CT6	R-C0057a	Trimmer
(COILS & TRANSFORMERS)		
L1 L9	R-W9016	VHF Coil 10½ turns
L2	R-W9015	VHF Coil 7½ turns
L3	R-W9034	VHF Coil 1½ turns
L4	R-W9018	VHF Coil 6½ turns
L5	R-W9058	VHF Coil 4½ turns
L6	R-W2413	Antenna Coil AM
L7	R-W8251-4	Oscillator Coil MW
L8	R-W8250-4	Oscillator Coil SW
T1	R-W5T336-3	IF Transformer
T2	R-W6255-2	Input Transformer
T3	R-W7152	Power Transformer AC220V

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
(MISCELLANEOUS)		
	IF-300	IF Assembled Block
	R-S6463a	Speaker 4" 4 ohms
	R-S6365	Earphone
	R-S1382	Telescopic Antenna
	R-23676	Lug Terminal
	R-113519	Shield Case - for IF-300
	R-S2180	Jack - PHONO, EARPHONE
	R-S81847	AC Cord 250V 6A
	R-S2191	Jack - AC input
	R-15341	Taper Spring - negative terminal
	R-23929	Battery Terminal - positive
	R-23899	Lug Terminal - fine tuning capacitor
	R-25239a	Spring Wire - grounding of tun. cap.
Tp-4	R-S3232①	Test Point
Tp-3	R-S3232②	Test Point
(FIXED VALUE RESISTORS)		
R101 R104 R107 R110	R-R222K	2.2K ohms
R102	R-R473K	47K ohms
R103	R-R121K	120 ohms
R105	R-R154K	150K ohms
R106 R112 R113 R707	R-R221K	220 ohms
R108	R-R470K	47 ohms
R109	R-R562K	5.6K ohms
R111	R-R150K	15 ohms
R702	R-R223K	22K ohms
R703	R-R472K	4.7K ohms
R704	R-R151K	150 ohms
R705	R-R683K	68K ohms
R706	R-R391K	390 ohms
R708 R710 R712	R-R101K	100 ohms
R709 R711	R-R102J	1K ohms ±5%
R714	R-R820K	82 ohms
(FIXED VALUE CAPACITORS)		
C101	R-CKD030K	Ceramic 3pF ±0.25pF mini
C102 C112	R-CKD150K	Ceramic 15pF ±10% mini
C103 C108 C704	R-CKD501M	Ceramic 500pF ±20% mini
C104 C109 C124	R-CKD102Z	Ceramic 0.001μF +80%
C105	R-CKD130K	Ceramic 13pF ±10% mini
C106 C110	R-CKD040K	Ceramic 4pF ±0.5pF mini
C107	R-CKD300K	Ceramic 30pF ±10% mini
C111	R-CKD150K	Ceramic 15pF ±10% N750
C113 C125	R-CQS103M	Mylar 0.01μF ±20%
C114 C118	R-CQS502M	Mylar 0.005μF ±20%
C116	R-CQT311K	Styrol 310pF ±10% mini
C117	R-CKD120K	Ceramic 12pF ±10% N2000
C119	R-CKD050K	Ceramic 5pF ±10% mini
C120	R-CQT312K	Styrol 3100pF ±10% mini
C121	R-CKD200K	Ceramic 20pF ±10% mini
C712 C713	R-CKD103Z	Ceramic 0.01μF +80%
C123 C707 C126	R-C9875	Electrol. 220μF 10V
C708 C709 C716 C718	R-CKD203Z	Ceramic 0.02μF +80%
C701	R-CRD752M	Ruthyl 0.0075μF ±20%
C702	R-C9140	Electrol. 0.3μF 10V
C703	R-C9882	Electrol. 4.7μF 6.3V
C705	R-C9880	Electrol. 100μF 6.3V
C706	R-C9881	Electrol. 33μF 6.3V
C710 C711	R-C9879-2	Electrol. 220μF 10V
C714	R-C9854-2	Electrol. 1000μF 10V
C715	R-C9895	Electrol. 470μF 10V

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